

TITLE OF INVENTION: VIRTUAL REALITY CARDIAC TRAINING DEVICE

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STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

Not Applicable.

5 REFERENCE TO "MICROFICHE APPENDIX"

Not Applicable.

BACKGROUND OF THE INVENTION

This Invention relates to a device and method for enhancing cardiovascular exercise. Cardiovascular exercise has been repeatedly shown to improve health and life  
10 expectancy of individuals. However, the effort required to engage in cardiovascular exercise and levels of boredom associated with the use of exercise machines is a major psychological barrier hindering individuals from participating in such exercise. The present invention helps to overcome this psychological barrier by creating a motivational environment for an individual exercising with an exercise machine that simulates the  
15 individual's participation in a live sporting event.

Prior efforts to alleviate user boredom have focused generally on linking an exercise machine with some audiovisual display device in an arrangement by which the exercise machine must be operated in order to operate the audiovisual display device. See, e.g., U.S. Pat. Nos. 4,161,630; 5,246,411; 4,278,095; 4,512,566; 5,374,227;  
20 4,692,004. All of these devices have inherent limitations in their effectiveness, including high costs and non-portability between different exercise machines. The present invention overcomes these problems by providing an exerciser with a portable system that may be used independently from any exercise machine. The present invention also

provides a superior motivational environment through the increased sensory input afforded by the created virtual reality, which creates the impression that the user is a participant in a sporting event rather than a mere spectator.

## SUMMARY OF THE INVENTION

5           The present Invention involves a method and device for stimulating an individual's participation in cardiovascular exercise by providing the individual with a virtual reality which simulates the individual's participation in real sporting events, for instance, the Boston Marathon or the cycling competition of the Tour de France. The apparatus comprises several distinct components, including (1) a primary playback  
10   device capable of playing a prerecorded audiovisual program; (2) a secondary playback device capable of playing digital audio program(s) selected and programmed by the user; (3) a recording of a sporting event on a recording medium readable by the primary playback device; and (4) a virtual reality display device, including both video display and audio reproduction equipment combined in a wearable headset.

15           In the preferred embodiment, the primary playback device comprises a portable digital versatile disc player similar to portable compact disc players that are currently commercially available. In another embodiment, the primary playback device comprises a tape playback unit capable of playing 8mm videotapes. In any of the embodiments, the recording of a sporting event is on a medium capable of being used with the primary  
20   playback device. The secondary playback unit of the preferred embodiment comprises a programmable memory card (known in the art as "flash memory") of at least 64 megabyte capacity which can be programmed by the user and which supports the major file format standards used in the art for digital audio programs. The audio signals of both

the primary and secondary playback devices are combined, giving the user the ability to experience both the sounds of a sporting event (generated by the primary playback device) as well as music or other sound to which the user desires to listen (generated by the secondary playback device). Those skilled in the art will understand how to combine  
5 the audio signals of the primary and secondary playback devices for output to the virtual reality display device.

Finally, the virtual reality display device of the preferred embodiment comprises some form of headgear (either helmet or headband) with both a visual display device and an audio reproduction device mounted to the headgear. The preferred virtual reality  
10 display device includes two small LCD screens mounted in a goggle-type arrangement in front of the user's eyes. The audio reproduction device includes a pair of speakers mounted to the headgear such that one speaker is positioned directly over each of the user's ears. The overall virtual reality display device is thus capable of receiving both a video input signal (from the primary playback device) as well as an audio input signal  
15 (from a combination of the audio signals of both the primary and secondary playback devices.) Such virtual reality display devices currently exist and will be familiar to those in the art. This virtual reality display device will provide a user with stereo audio and video. Due to the proximity of the audio and video devices to the user's eyes and ears, the virtual reality display device will overwhelm the user's actual environment with that  
20 produced by the primary and secondary playback devices, giving the impression that the user is actually present and participating in the prerecorded sporting event.

#### DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a user wearing the invention while using an exercise treadmill.

Fig. 2 shows a user wearing the invention while using a stationary cycle.

#### DETAILED DESCRIPTION OF THE INVENTION

Figs. 1 and 2 show users actually operating embodiments of the invention in conjunction with stationary exercise machines. Referring particularly to Figs. 1 and 2, one can see a user 22 wearing a virtual reality display device 12 and an audiovisual playback device 10 while using a stationary exercise machine 24. The audiovisual playback device 10 further comprises both a primary playback device 100 and a secondary playback device 102, neither of which are depicted in the drawings but which will be understood by those skilled in the art. Said primary playback device further comprises means 101 for generating both an audio and a video signal from a prerecorded medium 104. The prerecorded medium 104 contains a recording in either digital format (including, but not limited to, digital versatile disc, digital tape, or compact disc) or in analog format (including, but not limited to, analog video tape). Said secondary playback device 102 further comprises means 103 for generating an audio signal from a preprogrammed digital storage medium 106 (including, but not limited to, "flash" memory cards). The audiovisual playback device 10 further comprises means 108 for combining the audio signals of the primary playback device and the secondary playback device; said means are not depicted but will be understood by those skilled in the art.

The virtual reality display device 12 depicted in Figs. 1 and 2 further comprises either a helmet 14 or a headband 16. Mounted to either the helmet 14 or headband 16 are a visual display 18 and a pair of speakers 20. One will understand that the visual display 18 further consists of a pair of visual output units. Such virtual reality display devices

currently exist and will be understood by those skilled in the art. See., e.g., U.S. Pat. Nos.

In all embodiments of the invention, the user 22 places a prerecorded medium 104 into the primary playback device 100 of the audiovisual playback device 10. The user  
5 may also place a preprogrammed digital storage medium 106 into the secondary playback device of the audiovisual playback device 10 if desired. The preprogrammed digital storage medium 106 may contain any user-programmed digital audio materials that the user 22 may desire to listen to while using the invention. The prerecorded medium 104 contains a recording of a sporting event taken from the perspective of a participant in the  
10 event. The prerecorded medium 104 contains the recording of the sporting event at a variety of playback speeds such that the user 22 can select a playback speed simulating the pace at which the user 22 desires to exercise. During playback, the means 108 combines the audio signals of the primary playback device 100 and secondary playback device 102 into a single audio signal. The user 22 is therefore able to listen both to the  
15 sounds of the sporting event as well as the user's own music, thereby enhancing the desired motivational experience.

In all embodiments of the invention, the video signal and combined audio signal of the audiovisual playback device 10 are transmitted to the virtual reality display device 12. The virtual reality display device 12 converts these images into motion pictures and  
20 sounds through its visual display 18 and speakers 20. To increase stability in order to counter the motion of the user 22 while exercising, the virtual reality display device 12 may be mounted either to a helmet 14 or a headband 16; or both. In either case, the proximity of the visual display 18 and speakers 20 to the user's eyes and ears,

respectively, create the impression that the user 22 is physically present and participating in the sporting event recorded on the prerecorded medium 104.

#### CATALOGUE OF ELEMENTS

	10	Audiovisual playback device
5	12	Virtual reality display device
	14	Helmet
	16	Headband
	18	Visual display
	20	Speaker
10	22	User
	24	Stationary exercise machine
	100	Primary playback device
	101	Means for generating audio and visual signals
	102	Secondary playback device
15	103	Means for generating audio signal
	104	Prerecorded medium
	106	Preprogrammed digital storage medium
	108	Means for combining audio signals